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PTO/SB/21 (04-04) (AW 06/2004)
Approved for use through 7/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission 10*

Application Number	10/651,321
Filing Date	August 28, 2003
First Named Inventor	Heinz-Michael Zaoralek
Art Unit	3764
Examiner Name	
Attorney Docket No.	SSM-520US

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/Declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☒ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
  - ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation, Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) ____
- ☐ After Allowance Communication to Technology Center (TC)
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) (please identify below):

  Copy of twenty (20) references

Remarks:

***The total number of pages listed above does not include the number of pages of the references submitted with the Information Disclosure Statement.**

SIGNATURE OF APPLICANT, ATTORNEY OR AGENT

Firm or Individual Name	Christopher R. Lewis RatnerPrestia	*Registration No. (Attorney/Agent)*	36,201
Signature			
Date	August 12, 2004		

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appln. No:	10/651,321
Applicant:	Heinz-Michael Zaoralek
Filed:	August 28, 2003
Title:	ROLLER FOR THE THERMOMECHANICAL TREATMENT OF A WEB-SHAPED MEDIUM
TC/A.U.:	3764
Examiner:	

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. §§ 1.97 and 1.98 and to the duty of disclosure set forth in 37 C.F.R. § 1.56, the Examiner in charge of the above-identified application is requested to consider and make of record the references listed on the PTO 1449 (RP) submitted herewith. A copy of each of the listed references is also enclosed.

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made.

German Patent No. 100 17 604 is not in the English language, but an English language equivalent of this application, namely U.S. Patent Publication No. 2002/0029870 is enclosed herewith.

German Patent No. 199 57 847 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 6,460,611, is enclosed herewith.

German Patent No. 195 38 236 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 6,039,681, is enclosed herewith.

German Patent No. 44 04 922 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 5,725,466, is enclosed herewith.

German Patent No. 44 07 239 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 5,655,596, is enclosed herewith.

German Patent No. 2 363 063 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 3,834,205, is enclosed herewith.

German Patent No. 1 811 690 is not in the English language, but an English language equivalent of this application, namely U.S. Patent No. 1,279,264, is enclosed herewith.

European Patent No. 0 950 760 is not in the English language, but an English abstract thereof is attached to the copy of the reference submitted herewith.

International Publication No. WO 02/095249 is not in the English language, but an English language equivalent of this publication, namely European Patent No. 1 302 682, is enclosed herewith.

German Patent No. 40 361 121 is not in the English language, but a translation of the relevant portions of this patent is provided below:

Col. 3, lines 19-25:

It is therefore the object of the present invention to remedy the disadvantages of the prior art and in particular to design a roller such that a temperature profile is achieved which is as uniform over the entire roller body as possible.

This is achieved by the features listed in Claim 1.

Col. 3, lines 39-51:

In accordance with the invention, the diameters of the peripheral bores for example - which are arranged serially in a row in terms of flow - can be different, such that the heat transfer fluid flows at different speeds in the bores arranged in a row. However, each individual bore of a plurality of bores placed in parallel can also be provided with a correspondingly variable flow cross-section. In general terms, use is

made of the fact that the heat transfer coefficient of the fluid heat medium onto the wall of the bore is dependent on the speed at which the heat transfer fluid flows through the bores.

Col. 4, lines 5-13:

In accordance with the invention, the desired flow speeds in the peripheral bores and the associated uniform surface temperature of the roller can also be achieved by inserting displacement bodies of various diameters into the peripheral bores. The displacement bodies, which can for example be shrunk into the peripheral bores, can exhibit relatively finely graduated variations in diameter.

Col. 4, lines 27-39:

It is then for example possible to initially provide the peripheral bores - positioned in a row with respect to flow - with a uniform diameter, in order to then insert shaped pipes into the bores, said shaped pipes exhibiting continuous or discontinuous changes in their outer diameter. The gap between such a template and the wall of the peripheral bore can then be filled in with an appropriate insulating material. Once the templates have been removed, the result is an arrangement of peripheral bores having a consecutively continuously and/or discontinuously altered diameter.

Col. 6, line 59 through col. 7, line 24:

A peripheral bore is partially shown in Figure 4, partially filled in with a more elaborately configured displacement body 40. The transfer medium flows through the peripheral bore 20 or through the intermediate space between the displacement body 40 and the wall of the peripheral bore 20. The displacement body 40 discontinuously constricts the peripheral bore 20. The transfer fluid flows in the direction of the arrows 50. Given a constant throughput, the flow speed of the transfer fluid here is relatively low in the first region 42, such that the speed of heat medium and therefore the heat transfer coefficient are still relatively low. With the introduction of the displacement body 40, and given a constant throughput, the transfer fluid is forced into increasing its flow speed in the regions 44, 46 and 48. This is accompanied by an increase in heat transfer coefficient. As a consequence, the result of this is that despite a decrease in the temperature of the heat transfer medium, a constant quantity of heat is transferred onto the roller body 10 and therefore onto the surface of the roller.

The displacement body 40 inserted into the peripheral bore 20 can for example be composed of various pipes, inserted into each other and having different, nesting diameters 54, 56 58. A conical flow divider 52 at the beginning of the displacement body 40 serves on the hand as a seal for the displacement body 40 and on the other hand to continually adjust the flow proportions of the transfer fluid to the displacement body 40. Turbulence is to be avoided as far as possible here, since this can undesirably increase the heat transfer coefficient locally.

Claims:

1. A heating and/or cooling roller, in particular for processing web-like materials such as for example paper,

   a) comprising a roller body with peripheral bores for a heat transfer medium which can be heated and/or cooled, said bores preferably being placed axially parallel to the roller body, and

   b) comprising one screwed-on flange trunnion with at least one central bore for supplying and draining the heat transfer medium, characterised in that the peripheral bores (20) are modified such that the heat emission and/or adsorption through the wall of the bore via the roller shell onto the roller surface of the roller body (10) is substantially constant over the length of the roller body (10).

3. The heating and/or cooling roller as set forth in any one of Claim 1 or 2, characterised in that the peripheral bores (20) have a diameter which may be discontinuously or continuously altered over their length.

5. The heating and/or cooling roller as set forth in any one of Claims 1 or 4, characterised in that displacement bodies (40), preferably having different diameters, are inserted into the peripheral bores (20).

6. The heating and/or cooling roller as set forth in Claim 5, characterised in that the displacement bodies (40) discontinuously or continuously taper.

German Patent No. 200 11 530 is not in the English language, but a translation of the relevant portions of this patent is provided below:

Page 1, lines 1-4:

The invention relates to a heating roller including a roller body comprising peripheral bores beneath its surface which are connected to a heat medium supply arrangement.

Page 2, lines 4-26:

A fundamental problem in such rollers is that large temperature differences are undesirable either in the circumferential or in the axial direction. Different temperatures result in different thermal expansions. Even the smallest differences in diameter than result in different pressures in the nips of a calendar or glazing rollers, which in turn have a negative effect on the calendered material web.

The invention is based on the object of indicating a way of distributing the supplied heat more evenly.

In a heating roller of the type cited at the beginning, this object is solved arranging an insert in each peripheral bore, said insert cross-sectionally sub-dividing the bore into at least two channels.

It is therefore possible to establish, in each peripheral bore, a flow of the heat transfer medium both from one side of the roller to the other and from said other side back to the starting side.

Page 3, line 10 through page 4, line 15:

The cannels are preferably connected to each other at at least one end in such a way that at least one channel exhibits a through-flow direction which is opposite to that of another channel. The heat transfer medium is thus so to speak inverted while still inside the roller, i.e. it can flow back again through the same bore. Inverting the direction outside the roller is not necessary.

The bore is preferably closed at one end and the insert terminates before this end or at least comprises an opening in its wall. This is a simple design embodiment in order to connect the channels to each other at this end.

The insert is preferably hollow. In this case, a channel is available in the insert. One or more other channels can then be formed outside the insert, i.e. between the insert and the all of the bore.

This is the case in particular when the insert - viewed in cross-section - contacts the inner wall of the bore at at least two points. The insert then separates at least two channels from each other with its outers side, through which the heat transfer medium can then for example flow in different flow directions. The insert and the wall of the bore thus contact each other along a line, the contact being formed in such a way that adjacent channels are sealed off from each other. This seal does not have to be complete, but should be formed such that there is no significant transfer of heat transfer medium from one channel into the other.

The insert preferably exhibits the cross-sectional shape of a polygon. Such an insert can be easily produced and easily controlled. A polygon can be formed such that its corners abut the inner wall of the bore.

Page 6, lines 18-22:

Figure 1 shows a perspective representation of a cutaway of a roller 1 which is heated using a heat transfer medium (not shown in greater detail). The heat transfer medium supplied and drained via a feeding arrangement (also not shown in greater detail).

Page 6, line 28 through page 7, line 2:

The roller 1 comprises a shell 2 which is covered at at least one facing end by a flange 3. The flange 3 enables a plurality of peripheral bores 4, only one of which is shown, to be drilled from both sides of the roller shell 2. Instead of being formed with a roller shell, it can of course also be a solid roller. The roller shell 2 extends over the entire operating width A. The flange 3 is also situated outside the operating width.

Page 7, lines 10-30:

As can be seen in particular from Figure 2, an insert 5 in the form of a pipe is arranged in the bore 4. The insert 5 comprises openings 6 in its walls in the region of its end adjacent to the flange 3. Alternatively, the insert 5 can also terminate a little way before the flange 3. The insert 5 is supported via distancing pieces 7 of the wall of the bore 4, such that it maintains its position in the bore 4 even at higher speeds.

Arrows have been used to show how a heat transfer medium flows through the peripheral bore 4. The heat transfer medium enters the follow interior 10 of the insert 5 through an entrance 9, flows through the roller 2 over its entire axial length and then enters the intermediate space 11 between the wall 8 and the outer side of the insert 5 through the bore 6. The heat transfer medium then flows through the intermediate space 11, again over the entire axial length of the roller shell 2 but in the opposite flow direction, before leaving the roller at an exit 12.

Page 9, line 1-5:

The inserts can then exhibit highly different cross-sectional shapes. Figure 4a again shows the embodiment which also follows Figures 1 and 2. The insert 5 is situated in the bore 4 and exhibits a circular cross-sectional shape.

Page 9, lines 19-25:

In Figure 4b, the insert 5 is shown with a square shape , wherein the corners of the square abut the inner side 8 of the bore 4 is seal it off at these points. This results in a total of five channels, namely the inner space 10 of the insert 5 and another channel on each side of the square, said channels being otherwise delineated by the inner side 8 of the bore 4.

Page 10, lines 6-18:

Instead of a polygon with four sides, it is in principle possible to select polygons with any number of sides. By way of example in Figure 4d, a triangle is shown, while by way of example in Figure 4e, a hexagon is shown as the cross-sectional shape for the insert 5. Of course, the larger number of sides of the insert, the smaller the free flow cross-section into the intermediate space 11 between the wall 8 of the bore 4 and the insert 5.

In some respects, this problem can be reduced by arching the walls of the insert 5 to be concave, as shown in Figure 4f.

Page 10, line 23 through page 11, line 7:

Lastly, Figure 4g shows how to form the insert simply as a plate, sub-dividing the bore 4 into just two channels. By inclining the plate - as shown by an arrow 13 - it is

possible to influence which of the two channels separated from each other by the insert 5 has a greater influence on the surface 14 of the roller 2.

Figure 4h shows how to use not just one but two inserts 5a, 5b. These can be arranged alongside each other and contact each other as well s the inner wall 8 of the bore 4. In this way, too, it is possible to provide a large number of channels.

Page 11, lines 7-9:

Lastly, Figure 4i shows how to arrange a second insert 5b in an insert 5a, in order to create additional channels.

Claims:

1. Heating rollers comprising a roller body which comprises peripheral bores beneath its surface which are connected to a heat medium supply arrangement, characterised in that in each peripheral bore (4), an insert (5; 5a, 5b) is arranged which cross-sectionally sub-divides the bore (4) into at least two channels (10, 11).

This Information Disclosure Statement is being filed before mailing of the first Official Action. No first Official Action has yet been received and it is presumed that none has yet been mailed. No fee or statement is required. 37 C.F.R. § 1.97(b).

Respectfully submitted,

Christopher R. Lewis, Reg. No. 36,201
Attorney for Applicant

CRL/lrb
Enclosures: Form PTO/SB/08A
Copy of twenty (20) references

Dated: August 12, 2004

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The Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. **18-0350** of any fees associated with this communication.

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August 12, 2004

Christopher R. Lewis

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PTO/SB/08a (08-03) (AW 10/2003)
Approved for use through 7/31/2006. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

SHEET 1 of 1

Complete if Known	
Application Number	10/651,321
Filing Date	August 28, 2003
First Named Inventor	Heinz-Michael Zaoralek
Art Unit	3764
Examiner Name	
Attorney Docket No.	SSM-520US

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number: Number - Kind Code[2] (if known)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1	US-6,460,611-B2	10-08-2002	Zaoralek	
	2	US-2002/0029870-A1	03-14-2002	Schweinichen	
	3	US-6,039,681	03-21-2000	Heinz-Michael [Zaoralek]	
	4	US-5,725,466	03-10-1998	Eppli et al.	
	5	US-5,655,596	08-12-1997	Zaoralek	
	6	US-3,834,205	09-10-1974	Maag et al.	
	7	US-2,531,988	11-28-1950	Price	
	8	US-1,279,264	09-17-1918	Clinton	
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3] - Number[4] - Kind Code[5] (If known)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	9	DE-100 17 604-A1	10-18-2001	Walzen Irle GmbH		☐
	10	DE-199 57 847-C1	06-07-2001	Schwäbische Hüttenwerke GmbH		☐
	11	DE-200 11 530-U1	04-19-2001	Voith Paper Patent GmbH		☐
	12	DE-195 38 236-A1	04-17-1997	Schwäbische Hüttenwerke GmbH		☐
	13	DE-44 04 922-C2	09-28-1995	Schwäbische Hüttenwerke GmbH		☐
	14	DE-44 07 239-A1	09-07-1995	Schwäbische Hüttenwerke GmbH		☐
	15	DE-40 36 121-A1	01-30-1992	Schwäbische Hüttenwerke GmbH		
	16	DE-2 363 063	07-04-1974	The Procter & Gamble Co.		☐
	17	DE-1 811 690	07-02-1970	Krauss-Maffei AG		☐
	18	EP-0 950 760-A1	10-20-1999	Walzen Irle GmbH		☐
	19	EP-1 302 682-A1	04-16-2003	Mitsubishi Heavy Industries, Ltd.		☐
	20	WO-02/095249-A1	11-28-2002	Mitsubishi Heavy Industries, Ltd.		☐

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.

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[2]See Kind Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04.
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